PATENT SPECIFICATION

DRAWINGS ATTACHED

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845,327

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International Classification:—E 05d.

COMPLETE SPECIFICATION

Improvements relating to the Hinging of Glass Doors

We, TONKS (BIRMINGHAM) LIMITED, of Star Works, 201, Moseley Street, in the City of Birmingham, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the hinging of doors formed of toughened glass, and more specifically to hinge fittings of the kind known in the trade as patch fittings for use with toughened glass doors having no surrounding frame.

A known fitting of this kind comprises a pair of plates adapted to be mounted at opposite sides of a marginal edge portion of the glass, one of said plates (which is designed to be at the outer side of the door) having formed on its inner side an integral part which is shaped to fit within a recess formed in the edge of the glass, and screws passing through holes in the other plate into screw-threaded holes in said integral part of the one plate, and whereby the plates may be clamped against opposite sides of the glass.

Such a construction necessitates the manufacture of a large number of different parts to cater for fittings for both left hand and right hand doors and the object of the invention is to provide a fitting of convenient form which will enable the number of different parts required to be reduced.

According to the invention a hinge fitting of the kind specified comprises the combination of a pair of plates adapted to be mounted at opposite sides of the marginal edge portion of the glass, a separate spacing member shaped to fit within a recess formed in the edge of the glass and having formed in it a bore for accommodating a hinge pin, and at least two bolts with associated nuts for interconnecting the pair of plates, one of said bolts being engageable with its associated nut through holes in the two plates and a hole in the spacing member, whilst the other bolt is engageable with its nut through further holes in the plates without passing through the spacing member.

In the accompanying drawings:—

Figure 1 is an exploded perspective view of an example of a fitting in accordance with the invention;

Figure 2 is a perspective view showing the adjacent corners of parts to be interconnected by the fitting shown in Figure 1;

Figure 3 is a front view of the assembled fitting and parts shown in Figures 1 and 2;

Figure 4 is a front view similar to Figure 3 but with the front plates omitted, and

Figure 5 is side view of Figure 3

The drawings illustrate an example of the invention in its application to a fitting whereby not only is the upper part of a door 10 hingedly mounted relative to a toughened glass unframed transome 11 but the fitting serves also to connect the transome 11 to an upper and lower side panel (12 and 13 respectively) formed from unframed toughened glass.

For so-called patch fittings it is usual to form a recess at the corner of the pane of glass to receive the fitting, by first forming a circular hole in the glass near this corner, and then cutting the glass along two lines parallel to the two adjacent edges of the glass to meet the hole radially. The resulting recess (as shown in the door 10 and the transome 11) is thus defined by two edges *a*, *b* at right angles to one another with a sub-recess *c* formed at their junction by the initial hole, and it is for use with such recesses that the illustrated example of the invention is designed.

The fitting for attachment to the upper corner of the door panel 10 includes a pair

[*Price* (1)

of metal or other plates 14, 15 of the same size which are then adapted to lie at opposite sides of the glass, and a separate spacing member 16 adapted to be disposed between the plates. The spacing member 16 is in the form of a metal or other block of a thickness substantially equal to the thickness of the glass, and is shaped to fit closely within the recess in the corner of the glass whilst leaving sufficient clearance for the usual fibre or other packing 17 (Figure 4) for preventing metal to glass contact. Also the one corner of the block is cut away to concave or oblique form so as to allow for the accommodation in the sub-recess *c* of a cylindrical part 18 of a diameter equal to the diameter of the initial hole. Moreover, in a locally thickened part of the block is formed a bore 16*a* adapted to accommodate a hinge pin 19.

The hinge pin 19 may be made captive within the bore 16*a* and may project beyond the edge of the door into a bore 20*a* in an exactly similar block 20 in the complementary hinge fitting attached to the transome 11 which is also formed of toughened glass. Alternatively, the hinge pin 19 can be captive in the block 20 and may be angularly movable in the fitting on the door 10. In order to accommodate the thickened portion of the block 16 the pair of plates 14, 15 are recessed on their interior surfaces in appropriate positions.

For interconnecting the plates there are provided a pair of bolts 21 with each of which is associated a nut 22. The shank of each bolt has a part adjacent its head which has no screw-thread, and is of larger diameter than the screw-threaded end portion, whilst each nut 22 is a cap nut having a head and an internally screw-threaded hollow shank of a diameter equal to the wider part of the shank of the bolt. The one bolt is engaged with its nut through a pair of aligned holes in the pair of plates 14, 15 respectively, and through another hole in the distance piece 16. The other nut and bolt are interengaged through another pair of aligned holes in the pair of plates respectively and through the cylindrical part 18 which may be in the form of a bush having a fibre sleeve in its periphery and fitting closely within the sub-recess in the door; this nut and bolt therefore being removed from the spacing member. Moreover, the heads of the nuts 22 or of the bolts 21 are plain so that by passing the bolt through the fitting from the appropriate side it can always be arranged that a head without means for engagement by a tool is disposed at the outside of the door, irrespective of the hand of the door.

The complementary fitting for attachment to the transomes 11 may be exactly similar. However (as shown), where it is required that this fitting should serve also to support and interconnect side panels 12, 13 of toughened glass the one plate 23 may be of L shape and is designed to overlap the adjacent corners of the transome 11, and upper and lower side panels 12, 13. Opposite the limb of this plate 23 overlapping the transome is a plate 24 similar to the plates 14, 15 except that at its end adjacent the side panels it has an integral and outwardly directed flange 24*a*. Moreover the plate 24 is attached to the transome 11 and to the plate 23 by bolts 25 and associated nuts 26 engaged through the spacing member 20 and a bush 27 in an exactly similar manner to the fitting on the door.

Opposite the other limb of the plate 23 which overlaps the adjacent corners of both the upper and lower side panels 12, 13 is a small plate 28 having an integral and outwardly directed flange 28*a* which is in parallel and spaced relationship to the flange 24*a*. The adjacent corners of the upper and lower side panels 12, 13 are cut off obliquely so that at the junction of the panels there is formed a triangular recess. Within this recess is placed a substantially triangular distance piece 29 which at one side is stepped and bears against the spacing member 20. The distance piece 29 has a hole through which a bolt 30 passing through holes in the plates 23, 28 can be engaged with its associated nut 31.

Another glass panel 32 of the kind known as a fin is clamped between the two flanges 24*a*, 28*a* by means of a bolt 33 and associated nut 34 engaged through aligned holes in these flanges and through a bush 35 in a complementary recess in the fin. The purpose of the fin is to impart rigidity to the side panels 12, 13 due to the fact that it is disposed to a plane at right angles to the panels.

By the present invention since each fitting can be assembled from parts which have other applications, the number of parts which it is required to manufacture to meet all contingencies is considerably reduced as compared with known forms of patch fittings.

WHAT WE CLAIM IS:—

1. A hinge fitting of the kind specified comprising the combination of a pair of plates adapted to be mounted at opposite sides of the marginal edge portion of the glass, a separate spacing member shaped to fit within a recess formed in the edge of the glass and having formed in it a bore for accommodating a hinge pin, and at least two bolts with associated nuts for interconnecting the pair of plates, one of said bolts being engageable with its associated nut through holes in the two plates and a hole in the spacing member, whilst the other bolt is engageable with its nut through further holes in the plates without passing through the spacing member.

2. A hinge fitting as claimed in Claim 1 in

which said other bolt passes through a cylindrical part accommodated within a complementarily shaped sub-recess in the glass.

3. A hinge fitting comprising the combination and arrangements of parts substantially as described with reference to the accompanying drawings.

MARKS & CLERK.

PROVISIONAL SPECIFICATION

Improvements relating to the Hinging of Glass Doors

We, TONKS (BIRMINGHAM) LIMITED, of Star Works, 201, Moseley Street, in the City of Birmingham, a British Company, do hereby declare this invention to be described in the following statement:—

This invention relates to the hinging of doors formed of toughened glass, and more specifically to hinge fittings of the kind known in the trade as patch fittings for use with toughened glass doors having no surrounding frame.

A known fitting of this kind comprises a pair of plates adapted to be mounted at opposite sides of a marginal edge portion of the glass, one of said plates (which is designed to be at the outer side of the door) having formed on its inner side an integral part which is shaped to fit within a recess formed in the edge of the glass, and screws passing through holes in the other plate into screw-threaded holes in said integral part of the one plate and whereby the plates may be clamped against opposite sides of the glass.

Such a construction necessitates the manufacture of a large number of different parts to cater for fittings for both left hand and right hand doors and the object of the invention is to reduce the number of different parts required in a convenient manner.

According to the invention a hinge fitting of the kind specified comprises the combination of a pair of plates adapted to be mounted at opposite sides of the marginal edge portion of the glass, a separate spacing member shaped to fit within a recess formed in the edge of the glass and having formed in it a bore for accommodating a hinge pin, and at least two bolts with associated nuts for interconnecting the pair of plates, one of said bolts being engageable with its associated nut through holes in the two plates and a hole in the spacing member, whilst the other bolt is engageable with its nut through further holes in the plates without passing through the spacing member.

By way of example an embodiment of the invention will be described in its application to fittings whereby not only is the upper part of a door hingedly mounted relative to a toughened glass unframed transome but the fittings serve also to connect the transome to an upper and a lower side panel formed from unframed toughened glass.

For so-called patch fittings it is usual to form a recess at the corner of the pane of glass to receive the fitting, by first forming a circular hole in the glass near this corner, and then cutting the glass along two lines parallel to the two adjacent edges of the glass to meet the hole radially. The resulting recess is thus defined by two edges at right angles to one another with a sub-recess formed at their junction by the initial hole, and it is for use with such recesses that the embodiment of the invention to be first described is designed.

The fitting for attachment to the upper corner of the door panel includes a pair of metal or other plates of the same size which are adapted to lie at opposite sides of the glass, and a separate spacing member adapted to be disposed between the plates. This spacing member is in the form of a metal or other block of a thickness substantially equal to the thickness of the glass, and is shaped to fit closely within the recess in the corner of the glass whilst leaving sufficient clearance for the usual fibre or other packing for preventing metal to glass contact. Also the one corner of the block is cut away to concave or oblique form so as to allow for the accommodation in the sub-recess of a cylindrical part of a diameter equal to the diameter of the initial hole. Moreover, in a locally thickened part of the block is formed a bore adapted to accommodate a hinge pin.

The hinge pin may be made captive within the bore and may project beyond the edge of the door into a bore in an exactly similar block in the complementary hinge fitting attached to the transome which is also formed of toughened glass. Alternatively, the hinge pin can be captive in the block of the complementary fitting and may be angularly movable in the fitting on the door. In order to accommodate the thickened portion of the block the pair of plates are recessed on their interior surfaces in an appropriate position.

For interconnecting the plates there are provided a pair of bolts with each of which is associated a nut. The shank of each bolt has a part adjacent its head which has no screw-thread, and is of larger diameter than the screw-threaded end portion, whilst the nut is a cap nut having a head and an internally screw-threaded hollow shank of a diameter equal to the wider part of the shank of the bolt. The one bolt is adapted to be engaged with its nut through a pair of aligned holes in the pair of plates respectively, and through another hole in the distance piece. The other nut and bolt are interengaged

through another pair of aligned holes in the pair of plates respectively and through a cylindrical fibre bush which fits closely within the sub-recess in the door and is therefore removed from the spacing member. Moreover, the heads of the nuts or the bolts are plain so that by passing the bolt through the fitting from the appropriate side it can always be arranged that a head without means for engagement by a tool is disposed at the outside of the door, irrespective of the hand of the door.

The complementary fitting for attachment to the transome may be exactly similar. However, where it is required that this fitting should serve also to support and interconnect side panels of toughened glass the one plate may be of L shape and is designed to overlap the adjacent corners of the transome, and upper and lower side panels. Opposite the limb of this plate overlapping the transome is a plate similar to those on the door except that at its end adjacent the side panels it has an integral and outwardly directed flange. Moreover this plate is attached to the transome and larger L-shaped plate by bolts passing through a spacing member and a bush in an exactly similar manner to the fitting on the door.

Opposite the other limb of the L-shaped plate which overlaps the adjacent corners of both the upper and lower side panels is a small plate having an integral and outwardly directed flange which is in parallel and spaced relationship to the aforementioned flange. The adjacent corners of the upper and lower side panels are cut off obliquely so that at the junction of the panels there is formed a triangular recess. Within this recess is placed a substantially triangular distance piece which at one side bears on the two spacing members already mentioned, the triangular distance piece having a hole through which a bolt passing through the opposed plates can be engaged with its associated bolt.

Another glass panel of the kind known as a fin is clamped between the aforesaid two flanges by means of a bolt and associated nut engaged through aligned holes in these flanges and in the fin, the purpose of the fin being to impart rigidity to the side panels due to the fact that it is disposed in a plane at right angles to the panels.

In another embodiment the fittings are intended for use where the corner recesses in the door and transome are formed by cutting off the corner obliquely. In this embodiment the fitting at the upper corner of the door may be as in the first embodiment except that the spacing member is of triangular form. Moreover, as in the first embodiment only one bolt passes through the spacing member and the other passes through a fibre bush removed from the spacing member.

The other fitting comprises an L-shaped plate overlapping the adjacent corners of the transome, and upper and lower side panels, and three separate plates at the opposite side of the glass. Two of these plates are similar but oppositely arranged plates having integral flanges between which is adapted to be clamped a fin. The third plate at this side is disposed opposite the limb of the L-shaped plate overlapping the lower panels, and is similar to the plates on the door. Between the L-shaped plate and the said three plates is a single spacing member which is shaped to fill the triangular recesses at the corners of the transome and two side panels. Also each of the three plates at one side is connected to the L-shaped plate by one bolt and associated nut engaged through a hole in the spacing member, and by another bolt and nut engaged through a bush in a hole in the glass at a position removed from the spacing member.

The spacing member also has formed in it an appropriately positioned bore for the hinge pin as in the first embodiment.

If desired one of the spacing members may incorporate screw-means for moving the pivot pin laterally so as to permit of adjustment of the hinge axis of the door.

By the present invention since each fitting can be assembled from parts which have other applications, the number of parts which it is required to manufacture to meet all contingencies is considerably reduced as compared with known forms of patch fittings.

MARKS & CLERK.

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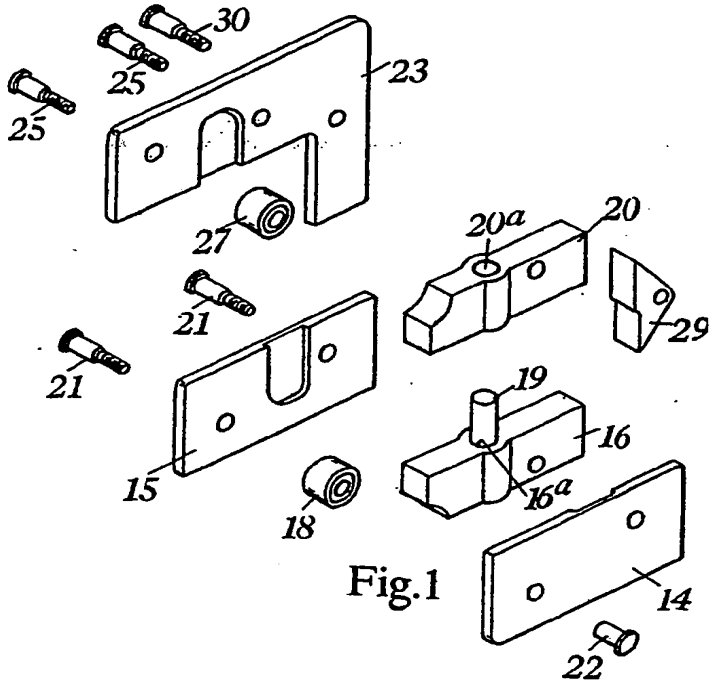

Fig.1

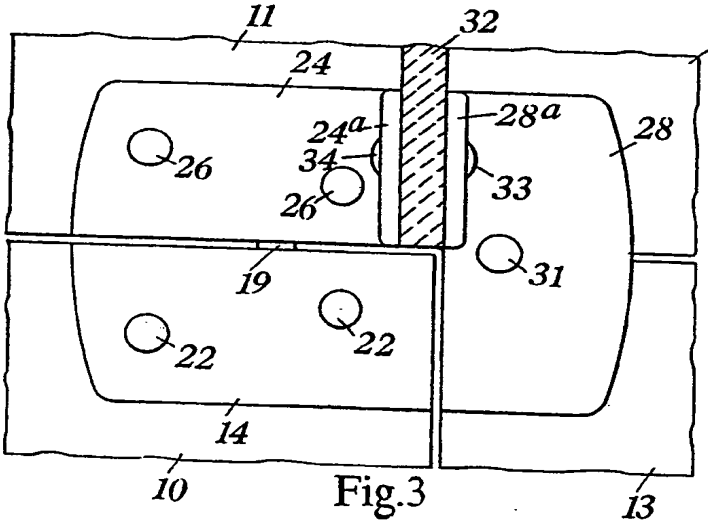

Fig.3

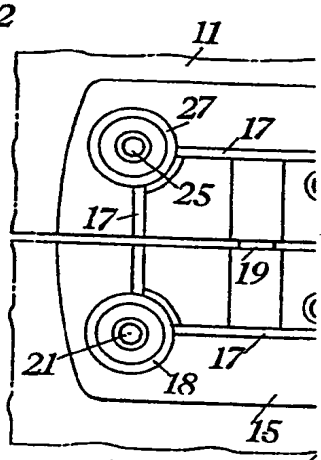

Fig.4

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1 SHEET

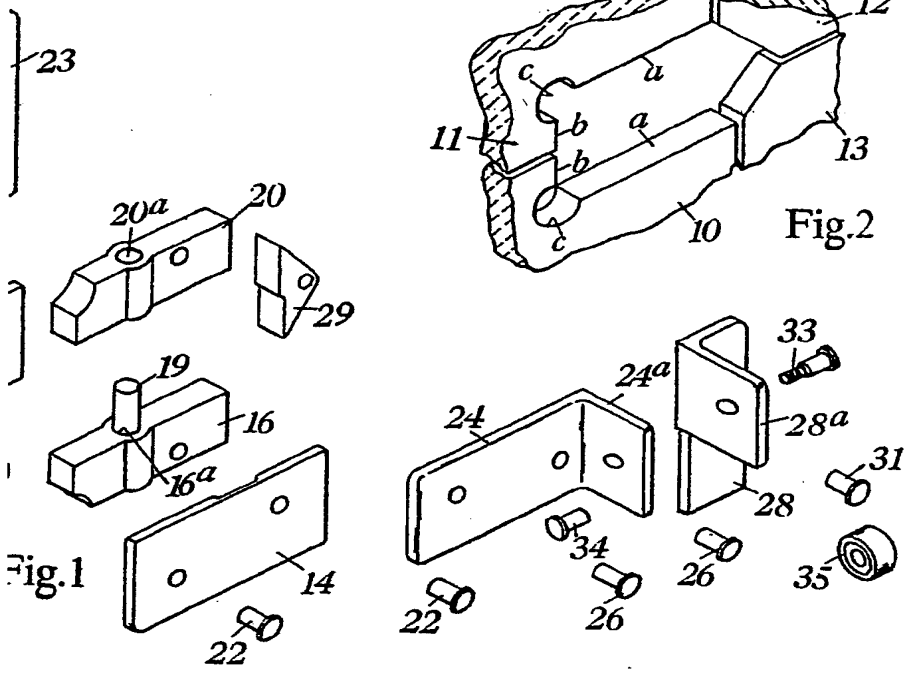


Fig.1

Fig.2

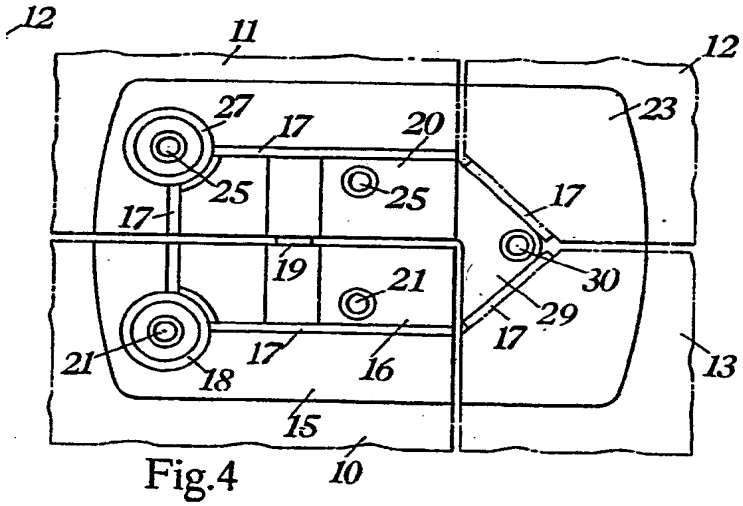


Fig.4

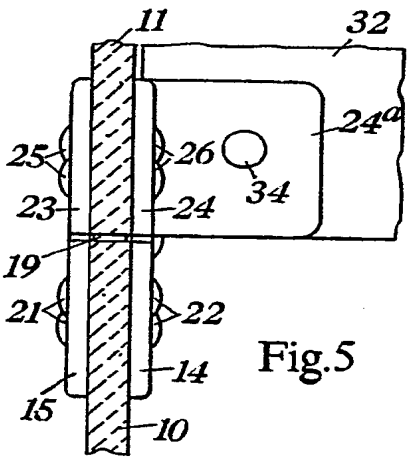


Fig.5

845,327 COMPLETE SPECIFICATION
1 SHEET

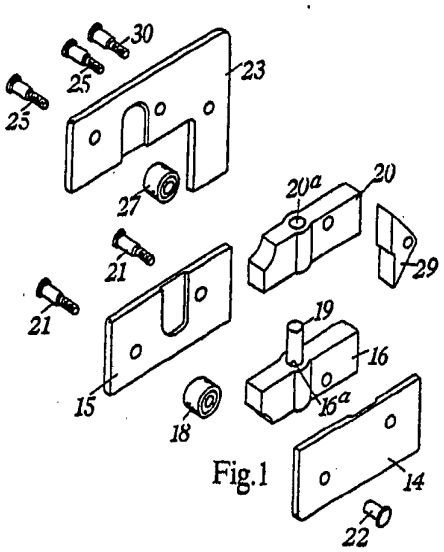


Fig.1

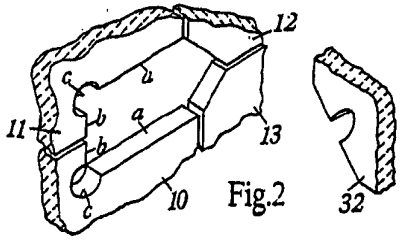
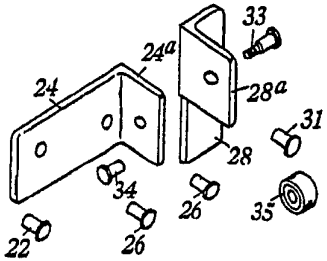


Fig.2



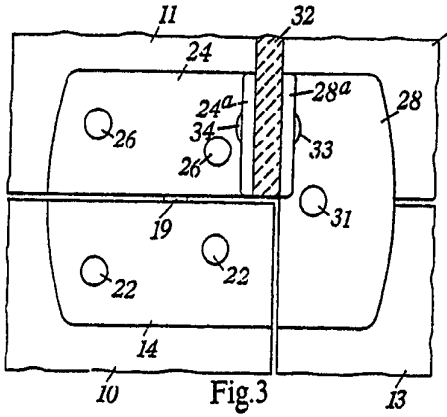


Fig.3

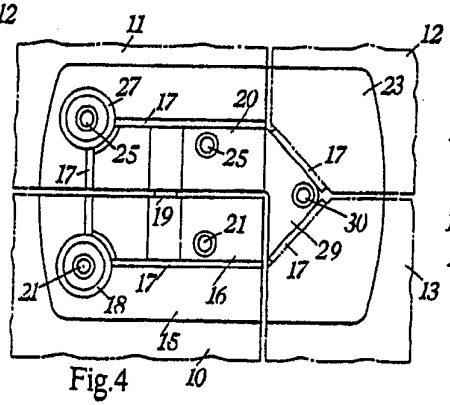


Fig.4

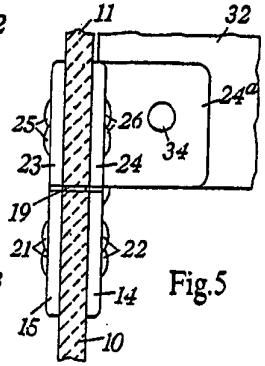


Fig.5